

Using Negatively Framed Questions to Evaluate Nursing Home Care

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Introduction

Negatively framed survey items use a negative construction such as “are you angry?” and “are you not happy?” and are not commonly used in surveys. This paper discusses our rationale for including negatively framed survey items in the CAHPS® Nursing Home Survey for Family Members (Nursing Home Family Survey). We describe the process of how we weighed several statistical measures for items and their composites against (a) results and recommendations from our literature review, (b) focus groups and (c) different stakeholders on our Technical Expert Panel to decide on including or excluding a set of 12 negative items.

Background on CAHPS® Surveys and the Family Member Survey

The Consumer Assessment of Healthcare Providers and Systems (CAHPS®) is a family of survey instruments designed to capture and report people’s experiences obtaining medical care. These surveys are available at the facility level (such as hospitals, dialysis centers) and ambulatory level (such as doctors’ offices and health plans). The CAHPS surveys are developed by following a set of design principles to ensure that the data are reliable, valid, credible and useful. These principles include: a) focusing on consumer/patient reports and assessment of the quality of their experience; b) focusing on items for which the respondent is the best or only source of information; c) obtaining stakeholders’ input; and d) conducting rigorous cognitive and psychometric testing (Crofton, Lubalin, & Darby, 1999).

Because the government (federal and state combined) pays for almost two-thirds of the \$131 billion of total nursing home costs, the Centers for Medicare & Medicaid Services (CMS) are interested in the consumers’ perspective on the quality of care they receive (CMS, 2008). As the federal agency responsible for nursing home quality oversight, CMS has supported the development of a consumer experience survey for both residents and their family members. The family member survey was designed to complement the resident survey, not serve as a proxy for those who cannot respond.

The nursing home setting is unique in that quality-of-care (QoC) is comingled with quality-of-life (QoL) since this is the residents’ home as well as a place where they receive health care. Residents receive care including medical and rehabilitation care and also personal care assistance with activities of daily living (ADLs) such as eating, toileting, walking, dressing, bathing—so the nursing home experience is unlike a person visiting a doctor as a discrete medical event but is experienced as a continuous/seamless health and personal care experience.

Another important feature of the nursing home environment is the imbalance of power between residents and staff. Because of their physical and/or mental limitations, residents are deeply dependent on staff for personal and medical care needs everyday. Most long stay residents (and their family members as well) are unable to do more for themselves (or their family members), cannot easily leave or are not empowered enough to complain to change conditions about which they are not happy (Nelson, 2000). Applying the social exchange theory to the nursing home setting, residents’ inability to reciprocate is the major element of their powerlessness and vulnerability (Nelson, 2000). Because of their vulnerability, fear of retaliation is often mentioned as a reason for nursing home residents not to complain (National Citizens’ Coalition for Nursing Home Reform, 1985; Institute of Medicine, 1995; Monk, Kaye, & Litwin, 1984). This theme of fear of retaliation was expressed in

the focus groups we conducted (Frentzel, Dardess, & Carman, 2005; Rand, 2005). Formal complaints are considered to be an underestimate since residents and family members have concerns about filing a formal complaint, in part because of fear of reprisals and because complaining is perceived to be futile (Hawes, 2002).

Use of Negative Items in Surveys

Use of both negative and positive items to reduce response set bias or guard against acquiescent behaviors has been used extensively historically (Benson & Hocevar, 1985; Chronbach, 1950; Nunnally, 1978; and Wright & Masters, 1982). One purpose is to prevent respondents from generally agreeing with survey statements. The assumption is that both positive and negative items are perceived as the same construct by respondents. However, the value of using negative and positive items has been questioned by some studies in the past two decades that show using both negative and positive items have not measured the same construct, have decreased internal consistency and/or have confused respondents due to changing from positive and negative statements. (Melnick & Gable, 1990; Pilotte & Gable, 1990; and Barnette, 2000).

Negatively framed items are not common in CAHPS: Most CAHPS surveys use only positively framed or neutral items. Negative items are found in three CAHPS surveys: the CAHPS Health Literacy Supplemental set for clinician and group practices (n=4); the CAHPS Health Literacy Supplemental for the hospital survey (n=8) (in development); and the CAHPS Cultural Competency surveys (n=12), the latter two are in development. An example of a negatively worded CAHPS item in these surveys include, “how often did the nurses use a rude tone or manner with you?” In the pilot version of the Nursing Home Family Survey, there were 12 negatively framed items (Table 1), of which we retained nine in the final version.

Item Number	Item text
15.	In the last 6 months, did you ever see any nurses or aides be rude to your family member or any other resident? Yes/No (Y/N)
16.	In the last 6 months, did you ever see any nurses or aides treat your family member or any other resident roughly? Y/N
17.	In the last 6 months, did you ever see another resident be rude to your family member (or any other resident)? Y/N
19.	[If you helped your family member with eating,] was it because the nurses or aides either didn't help or made him or her wait too long? Y/N
21.	[If you helped your family member with drinking,] was it because the nurses or aides either didn't help or made him or her wait too long? Y/N
23.	[If you helped your family member with toileting,] was it because the nurses or aides either didn't help or made him or her wait too long? Y/N
31.	In the last 6 months, did the nurses and aides ever try to discourage you from asking questions about your family member? Y/N
36.	In the last 6 months, did you ever see the nurses and aides fail to protect any resident's privacy while the resident was dressing, showering, bathing, or in a public area? Y/N
37.	Personal medical belongings are things like hearing aids, glasses, and dentures. In the last 6 months, how often were your family member's personal medical belongings damaged or lost? Never, Once, Two or more times
39.	In the last 6 months, when your family member used the laundry service, how often were clothes damaged or lost? Never, Once or twice, three or more times
40.	In the last 6 months, were you ever unhappy with the care your family member received at the nursing home? Y/N
43.	In the last 6 months, did you ever stop yourself from talking to any nursing home staff about your concerns because you thought they would take it out on your family member? Y/N

For the Nursing Home Family Survey, one purpose of using negative items has been to measure unique constructs that could not be framed as a positively written item. Because of the significant issue of staff failing to respond to requests for assistance in nursing homes (NORS, 2008), the CAHPS team developed items that would explore the issue of staff responsiveness on the most essential ADLs – eating, drinking fluids and toileting. For example, the survey asks a screener question, “In the last 6 months, during any of your visits, did you help your family member with eating?” and if yes, the survey then asks, “Was it

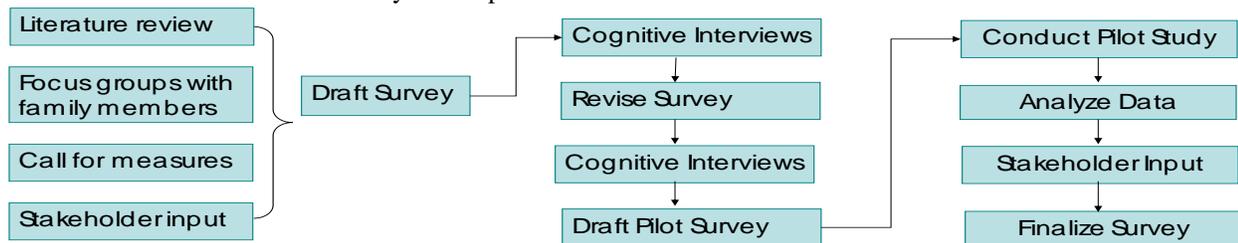
because the nurses or aides either didn't help or made him or her wait too long?" Two similar items to this on drinking and toileting are also asked. Had these items been written in a positive frame, e.g., "How often did the nurses or aides help your family member with eating?" the items would capture a different construct.

Similarly, the item, "in the last 6 months, did the nurses and aides ever try to discourage you from asking questions about your family member?" would not have the same meaning if positively framed, for example, "in the last 6 months, did the nurses and aides ever try to encourage you to ask questions about your family member?" When positively framed, it measures a different construct that does not help to elucidate a potentially significant problem in the nursing home. Monk, Kaye, and Litwin (1984) found that about one-fifth of the patient population held back from talking about a problem because of fear of reprisals.

Methods

The Nursing Home Family Survey followed a similar process as all other CAHPS survey development projects (see Exhibit 1, below). The Nursing Home Family Survey was the second nursing home survey that the CAHPS team developed, the first being the CAHPS Nursing Home Resident Survey (Sangl et al., 2007). Drawing on literature from the resident survey, a literature review previously conducted by the University of Colorado, and additional more recent research, the team developed a list of domains and ultimately a draft survey (Congdon, et al, 2004; Frenzel, Evensen, Keller, & Garfinkel, 2008).

Exhibit 1: Process for CAHPS Survey Development



The team supplemented the items with data from focus groups with family members conducted in 2005 and a call for measures in the Federal Register in 2004. We used the results from the call for measures, the literature review, and the focus groups, to develop a list of initial domains and questionnaire items within each domain. A total of 90 items were developed for this initial survey instrument.

We then conducted two rounds of cognitive testing. The purpose of the cognitive testing is to identify and eliminate problems associated with comprehension and navigation of the questionnaire items. The interviews will mitigate problems associated with ambiguous wording, respondent knowledge, and literacy, and will reduce respondent burden. The team conducted a total of 27 interviews in the first testing round in June 2005 and conducted another 27 interviews in the second round in June 2006.

Following the first round of cognitive tests, we revised the items and prepared a protocol for the second round of cognitive testing. This round tested the items as both self-administered items and as interviewer-administered items under the assumption that the final instrument would probably be administered by both mail and telephone. The instrument was revised again after the second round of cognitive testing.

Between the two rounds of testing, the team met with a Technical Expert Panel (TEP) in late 2005 to obtain their guidance and suggestions about the draft survey and composites or groups of related items. The TEP included representatives from the nursing home industry, regulators and quality improvement organizations, consumer advocates (including nursing home ombudsman), providers, and long-term care researchers.

The instrument was field tested in east Texas from early October 2006 to January 2007. The Texas State Long Term Care Ombudsman recruited 15 Texas nursing homes and the Health Quality Council. In addition, the Health Quality Council of Alberta conducted an independent field test in Alberta and contributed their data to AIR for the psychometric analysis conducted by AIR. The TEP provided a review afterwards to ensure that necessary substantive items were included.

Psychometric Analysis

Prior to data collection and in consultation with stakeholders, we organized 31 of the substantive survey items into a set of five domains (Getting Care Quickly; Quality of Care by Nurses and Aides; Communication of Nurses and Aides; Communication—Other Staff and Administrators; and Nursing Home Environment). We conducted a confirmatory psychometric analysis using both the Alberta and Texas data and calculated a Cronbach's alpha for each of the five domains. The alphas for three of the five domains were greater than the standard 0.70, but the alphas for two of the domains were lower. While these results provided some support for the hypothesized relationships, the item-total correlations for the domains indicated that each domain's alpha would improve if certain items were dropped, which indicated that it was likely that there was a better item-domain structure to be specified. Separate analyses of the Alberta and Texas data replicated these findings.

We then conducted exploratory analyses to identify composites. To make use of all available data, we obtained maximum likelihood estimates of the covariance matrix under the Missing at Random (MAR) model using a multiple imputation procedure (Rubin, 1976; Rubin, 1987; see also Hurtado, Angeles, Blahut & Hays, 2005; Keller, et al, 2005; and O'Malley, et al, 2005 for the use of the MAR model and SAS PROC MI in CAHPS surveys).

We conducted an exploratory factor analysis (EFA) on the correlation matrix produced by PROC MI. The EFA used the principle factor method with squared multiple correlations as initial communality estimates, and oblique rotation (promax) with Kaiser normalization. The number of factors was determined by the eigenvalues and the interpretability of the rotated factor pattern matrix. The EFA results did not demonstrate a definitive underlying factor structure for these 31 items. The instrument development team considered these results along with prior research on nursing home quality assessment and input from stakeholders such as nursing home administrators as well as nursing home patient ombudsman. The alternative composite structures that were suggested and evaluated using multi-trait multi-item analysis (Hays, Hayashi, Carson, & Ware, 1988; Ware, Harris, Gandek, Rogers, & Reese, 1997). This analysis computes the correlation of each item with each hypothesized scale corrected for overlap (item-to-total correlation), and produces statistics that indicate whether an item is more highly related to its own scale than to the other composites (scaling success). In other words, the analysis measures convergent and discriminant validity of an item as an indicator of the quality composite to which it is hypothesized to belong.

Findings

The team agreed on a final set of 21 total items (nine of which were negatively framed with the ninth item becoming a new global) organized into four composites. Not all items were included. The team, in consultation with the Technical Expert Panel eliminated ten items from the survey, two of which were negative items. In order to determine which items to keep and which items to eliminate, we closely reviewed the psychometric properties of the composites and items. We used an inter-unit reliability statistic to determine how well items and composites were able to detect differences – or discriminate – across nursing homes. We assessed the convergent validity of the items within each composite by examining the item-to-total correlations and the factor loadings.. In every case these ten items had either poor convergent or discriminant validity with their composite, did not discriminate among nursing homes, and/or contained content that was included elsewhere in the survey. Two of the negative items that were retained among the 21 had marginal measurement properties but were very important to the consumer advocates and nursing home resident ombudsman in our stakeholder panel and were also indicated as a significant problem by Ombudsman data (NORS, 2008). These were included to maintain the content validity of the survey. The eight negatively-framed items were kept either because they had good or excellent measurement properties or because they discussed aspects of care that ombudsman had identified as particularly important to patients (see Table 2, last column).

Overall, the negative items have similar nursing home reliability scores and factor loadings compared to positive items. For item to total correlations, negative items have lower correlations than positive items but generally above the targeted or recommended minimum (targets are noted in parentheses at the top of the columns in Table 2 (Targets for inter-unit reliability are based on previous work cited in Keller et al., 2005; Targets for factor loadings are from Nunnally, 1978; and targets for the item-to-total correlation came from are based on previous work cited in Keller et al., 2005). However, for the purpose of developing composites, the attributes the CAHPS instrument team cares strongly about are the composite-level scores.

Item	Nursing home reliability (≥ 0.70)	Factor Loadings (>0.30)	Item-to-total Correlation (>0.40)	Rationale for keeping
Composite 1: Meeting Basic Needs	0.48			
19. Wait too long [for eating help]? Y/N	0.46	0.65	0.83	These items represent a common complaint to ombudsmen and measure the vulnerability of residents; also, NH-level reliability will increase if a larger sample size is feasible.
21. Wait too long [for drinking help]?	0.32	0.62	0.83	
23. Wait too long [for toileting help]?	0.55	0.78	0.79	
Composite 2: Kindness and Respect	0.83			
15. Nurses or aides rude to family member?	0.64 (0.16 – 0.82 for positive items)	0.51 (0.68 – 0.85)	0.50 (0.72 – 0.82)	No statistical or substantive concerns
Composite 3: Info & Encourage	0.85			
31. Nurses or aides discourage questions about family member?	0.48 (0.63 – 0.85 for positive items)	0.31 (0.47 – 0.74)	0.31 (0.58 – 0.74)	Focus group data and advocates/ombudsmen strongly supported item

Item	Nursing home reliability (≥ 0.70)	Factor Loadings (>0.30)	Item-to-total Correlation (>0.40)	Rationale for keeping
Y/N				
43. Ever stop yourself from talking to any nursing home staff? Y/N	0.50 (0.63 – 0.85)	0.48 (0.47 – 0.74)	0.47 (0.58 – 0.74)	Literature review, focus groups and advocates/ombudsmen strongly supported item
Composite 4: Staffing, Belongings, & Cleanliness	0.89			
37. Family member's personal medical belongings damaged or lost?	0.21 (0.76 – 0.88 for positive items)	0.33 (0.58 – 0.71)	0.25 (0.49 – 0.60)	Focus group data and advocates/ombudsmen strongly supported item
39. Family member's clothes damaged or lost?	0.82 (0.76 – 0.88)	0.46 (0.58 – 0.71)	0.35 (0.49 – 0.60)	Slightly lower than recommended item-total correlation and focus group and advocate/ombudsmen strongly supported item

For the 9th negative question, item 40, “In the last 6 months, were you ever unhappy with the care your family member received at the nursing home?” the team decided to keep this as a new global item. In the CAHPS team opinion, this item acted more like a global item although it has a high nursing home reliability, it did not scale well with any of the composites.

The internal consistency reliability (Cronbach's alpha) was relatively high for all four composites, which indicates that the scores would provide reliable data. Notably, the composite with the highest alpha is also the first CAHPS composite composed entirely of negative items. The mean scores indicate that responses were well distributed.

Composite	Total # of items	Total number of negative items	Mean (SD)	Alpha (>0.70)
1. Basic Needs	3	3	73.5 (39.3)	0.90
2. Staff Kindness and Respect	5	1	84.8 (19.9)	0.88
3. NH Info & Encouragement	6	2	87.4(17.0)	0.78
4. NH Staffing, Care & Cleanliness	7	2	80.5(17.1)	0.79

Three negatively framed items were removed from the final survey primarily because of poor item-level statistics. Both the nursing home reliability scores were low as were the correlation with the global questions (were you ever unhappy with the care, would you recommend the nursing home, and the overall global rating of the nursing home). In addition to the poor statistics, the team and the Technical Expert Panel also agreed that these items were not as critical as other items.

#	Items	Nursing Home Reliability (> 0.70)	Correlation with Global Questions	Justification for Removing
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16	Nurses or aides treat family member roughly	0.14	0.24 – 0.32	Marginal measurement characteristics: Low nursing home-reliability and did not correlate highly with global questions. In addition, item 15 (“rude” question) facilitated assessing issues similar to this concept.
17	Another resident rude to family member	0.08	0.20 – 0.26	Marginal measurement characteristics: Low nursing home-reliability and did not correlate highly with global questions. This was also not considered critical by the team or the technical expert panel.
36	Nurses or aides didn’t protect modesty	0.56	0.20 – 0.23	Marginal measurement characteristics: Low nursing home-reliability and did not correlate highly with global questions. This was also not considered critical by the team or the technical expert panel.

Discussion

The composite structure that the team agreed to presents the best combination of conceptual properties and statistical support. Table 5 presents the final composite structure. In some cases, the team opted to retain items that were not as statistically strong, but based on input from the Technical Expert Panel, focus group data, cognitive interview, and background information from the national ombudsman program, these items were retained.

Table 5. Final Composite Structure and Items	
#	Composite or Item Handle
Composite 1: Meeting Basic Needs: Help with eating, drinking, toileting	
19*	Wait too long for help with eating
21*	Wait too long for help with drinking
23*	Wait too long for help with toileting
Composite 2: Nurses or Aides' Kindness and Respect Towards Resident	
12	Nurses or aides treat resident with respect
13	Nurses or aides treat resident with kindness
14	Nurses or aides really cared about resident
15*	Nurses or aides rude to resident
26	Nurses or aides appropriate with violent resident
Composite 3: Nursing Home Provides Info/ Encourages Respondent Involvement	
29	Nurses or aides give respondent information about resident
30	Nurses or aides explain things to respondent
31*	Nurses or aides discourage respondents from asking questions
43*	Respondent stops self from complaining
45	Respondent involved in decisions about care
53	Respondent given information about payments or expenses
Composite 4: Nursing Home Staffing, Care of Belongings, and Cleanliness	
11	Can find a nurse or aide
51	Enough nurses or aides
32	Room looks and smells clean
24	Resident looks and smells clean
35	Public areas look and smell clean
37*	Family member’s medical belongings lost
39*	Family member’s clothes lost

*Negative items

In 2008, the top complaint of nursing home residents and their families, eliciting some 14,329 complaints to ombudsmen, was failing to respond to requests for assistance. The first composite, meeting basic needs, covers the top complaint identified by ombudsmen, indicating a critical need to assess how well and how poorly a nursing home provides basic care. Specific complaints relating to these items include lack of assistance with toileting which had 3,404 complaints; lack of assistance

with drinking which had 2,899 complaints; and lack of assistance with eating which had 1,529 complaints (NORS, 2008). Similarly, most of the other negative items were also major sources of complaints. While no specific complaint used the word “rude”, complaints relating to dignity, respect and staff attitudes totaled 9,075. Fear of reprisals totaled 687—which may not seem high, but given the research indicating that people seldom complain about fear of reprisals, it suggests a significant issue. Finally, loss of laundry was mentioned 1,771 times in 2008.

Our final model rested both on statistical findings and substantive issues raised by multiple sources, including family members of residents via our focus groups, cognitive testing, and our Technical Expert Panel. While a few items were not statistically strong, we ultimately opted to keep these items because they were substantively meaningful despite poor statistics. As one focus group participant stated, “I want to know those [nursing home] places that are terrible...I want to know that as well” (Rand, 2005). Retaining negatively framed items that meet many of the psychometric criteria for either item or composite level achieves this goal of providing information about the less positive aspects of nursing homes which consumers may wish to know to avoid selecting such homes.

References

- Barnette, J. J. (2000). Effects of stem and likert response option reversals on survey internal consistency: If you feel the need, there is a better alternative to using those negatively worded stems. *Educational and Psychological Measurement*, 60 (3): 361-370.
- Benson, J. & Hocevar, D. (1985). The impact of item phrasing on the validity of attitude scales for elementary school children. *Journal of Educational Measurement*, 22: 231-240.
- Centers for Medicare & Medicaid Services. (2008). National Health Expenditures: 2007 Highlights. Retrieved December 31, 2009 from <http://www.cms.hhs.gov/NationalHealthExpendData/downloads/highlights.pdf>.
- Congdon, J. G., Magilvey, J.K., Jones, K.R., Morgenstern, N. E., Vojir, C.P., Dingley, C. E., Scott, J. A., & Kramer, A.M. (2004). *Quality Factors in Nursing Home Choice*. A technical report submitted to the Agency for Healthcare Research and Quality under grant # R18 HS10926-03. University of Colorado Health Sciences Center.
- Crofton, C., Lubalin, J. & Darby, C. (1999). Foreword (March 1999 supplement) *Medical Care*, 37(3): MS 1-MS9.
- Cronbach, W. J. (1950). Further evidence on response sets and test design. *Educational and Psychological Measurement*, 10: 3 – 31.
- Frentzel, E., Dardess, P., & Carman, K., (2005). *Reporting nursing home quality: Draft results from focus groups with people who have not yet chosen a nursing home*. Report submitted to the Agency for Healthcare Research and Quality. Washington DC: American Institutes for Research.
- Frentzel, E., Evensen, C., Keller, S., Garfinkel, S. (2008). *CAHPS survey for family members of nursing home residents*. Final Report submitted to the Agency for Healthcare Research and Quality. Washington DC: American Institutes for Research.
- Hawes, C. (2002). Elder abuse in residential long-term care facilities: What is known about prevalence, causes, and prevention. Testimony Before the U.S. Senate Committee on Finance.
- Hays, R. D., Hayashi, T., Carson, S., & Ware, J. E. (1988). *User's guide for the multitrait analysis program (MAP)*. Santa Monica, CA: Rand Corporation.
- Hurtado, M., Angeles, J., Blahut, S.A. & Hays, R., (2005). Assessment of the equivalence of the Spanish and English Versions of CAHPS[®] Hospital Survey. *Health Services Research*, 40 (6) Part II: 2140–2161.
- Institute of Medicine. (1995). *Real People, real problems: Evaluation of the long-term care ombudsman program of the Older Americans Act*. Washington, D.C.: National Academy Press.

- Keller, S.D., O'Malley, A.J., Hays, R.D., Zaslavsky, A.M., Hepner, K.A. & Clearly, P.D. (2005). Methods used to streamline the CAHPS[®] Hospital Survey. *Health Services Research*, 40(6) Part II: 2057-2077.
- Melnick, S. A. & Gable, R. K. (1990). The use of negative item stems: A cautionary note. *Educational Research Quarterly*, 14 (3): 31-36.
- Monk, A., Kaye, L.W., & Litwin, H. (1984). *Resolving grievances in the nursing home: A study of the ombudsmen program*. New York: Columbia University Press.
- National Citizens' Coalition for Nursing Home Reform. (1985). *A consumer perspective on quality care: The residents' point of view*. Washington DC: National Citizens' Coalition for Nursing Home Reform.
- National Ombudsmen Reporting System. (2008). Top 20 complaints by category for nursing facilities (FFY 1996-2008). 2008 National Ombudsman Reporting System Data Tables (Unlettered Tables in Appendix B). Retrieved on December 31, 2009 from http://www.aoa.gov/AoARoot/AoA_Programs/Elder_Rights/Ombudsman/National_State_Data/2008/Index.aspx.
- Nelson, H. W. (2000). Injustice and conflict in nursing homes: Toward advocacy and exchange. *Journal of Aging Studies*, 14 (1): 39-61.
- Nunnally, J. C. (1978). *Psychometric theory* (2nd ed). New York: McGraw Hill.
- O'Malley A.J., Zaslavsky, A.M., Hays, R.D., Hepner, K.A., Keller, S.A. & Cleary, P.D. (2005). Exploratory factor analyses of the CAHPS Hospital Pilot Survey responses across and within medical, surgical and obstetric Services. *Health Services Research*. 40(6), Part II: 2078-2095.
- Pilotte, W. J. & Gable, R. K. (1990). The impact of positive and negative item stems on the validity of a computer anxiety scale. *Educational and Psychological Measurement*, 50: 603-609.
- RAND Corporation (2005) Focus group with family members of nursing home residents, Los Angeles, conducted between 4/21/05 to 4/26/05.
- Rubin, D.B. (1976). Inference and missing data. *Biometrika*, 63: 581-592.
- Rubin, D.B. (1987). *Multiple imputation for nonresponse in surveys*. New York: John Wiley & Sons, Inc.
- Sangl J., Buchanan J., Cosenza C., Bernard S., Keller S., Mitchell N., Brown J., Castle N., Sekscenski E., & Larwood D. (2007). The Development of a CAHPS Instrument for Nursing Home Residents (NHCAHPS). *Journal of Aging and Social Policy*, 19(2): 63-82.
- Ware J.E., Harris W.J., Gandek B., Rogers B.W., & Reese P.R. (1997). *MAP-R for Windows: Multitrait/multi-item analysis program – revised user's guide*. Boston, MA: Health Assessment Lab.
- Wright, B. D. & Masters, G., N. (1982). *Rating scale analysis*. Chicago: Mesa Press.